



## Product Design Specification

Educational Child's Toy

|                                                    |                      |
|----------------------------------------------------|----------------------|
| <b>Product: Toy</b>                                | <b>Date: 10/3/23</b> |
| Team Name: Kadana                                  | Version: 1           |
| Team Members: Dani, Katherine, Ana Trujillo Garcia |                      |
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### 1. Performance

- A timeless toy that encourages growth in motor skills and cognitive development. Refer to the learning systems of a 2-3 year old.

### 2. Environment

- Resistant to rain, snow, water, cold temperatures and heat. Assume the child will leave the product in the pool, snow, freeze, sunlight etc. resistant to normal corrosion and material must not gather dust or dirt. It must be baby-safe for children two years old, if possible one-year-olds as well.

### 3. Life in Service

- As long as possible, 50 years, should be passed down through generations

### 4. Maintenance

- Minimal maintenance.
- The main material will be wood, which uses heat-treated, pressurized wood so warping is limited. Add a coat to protect against liquids, and keep color. Replacement of parts must be easy, no lubrication is necessary to work. It must be cleaned easily and withstand pull tests.

### 5. Target Product Cost

- 40 dollars maximum retail cost, the cost for producing Pr

### 6. Competition

- The rest of the classroom and current market.

### 7. Packaging

- Packaging that can withstand constant pull, adding and dumping things out. Intuitive clean up. Packaging must become an implicit lesson in cleaning up.

### **8. Shipping/Transportation**

- Does not damage quickly, is easy to transport, and does not cause paper cuts plastic cuts or splinters with packaging or product.

### **9. Quantity**

- Four units, one for each of us team members and one for Jasper.

### **10. Manufacturing Facility**

- The stamps studios, fabrication studio which includes CNC router, laser cutters, Vinyl cutters, and 3D printers, use of the wood shop will be used. Use of Metal cold shop and hot shop is unlikely but perhaps.

### **11. Size**

- 12" x 12" 12"

### **12. Weight**

- Must weigh less than four pounds.

### **13. Aesthetics**

- The limited color palette, 5 main colors with variations, will test the colors if not we will have more natural colors that mimic the cars.

### **14. Materials**

- Mostly wood.

### **15. Product Life Span**

- As long as possible

### **16. Standards/Specifications**

- ASTM F963 Toy Safety Standard Required by U.S. Law, Act of 2008 (CPSIA), must use child-safe super glue or construct with a CNC router so no parts can be disassembled and must check sizes.

### **17. Ergonomics**

- No sharp edges exposed, no ability to deconstruct toys without a screwdriver to make sure small hands do not get small things in their mouth. Comfortable maneuverability for small hands does not require much strength to use and is comfortable for children. Magnet snaps of the parts of the toys will prove satisfactory.

### **18. Customer**

- It is expected that the customer will be a parent and the end user will be a child of 2-3 years.

### **19. Quality and Reliability**

This product will be made to the highest standard possible for three art students varying from sophomores and juniors in the Stamps School of Art and Design. Knowledge of tools and precision will be implemented. Product will not exceed a tolerance of 1/16th" in variance from one another. Color may vary slightly based on if we use wood stains, or if we mix our colors.

### **20. Shelf Life Storage**

The product will be stored in the classroom until taken home, individual packaging will be designed. This is a non-perishable product so there is no limitation on shelf life.

### **21. Processes**

- Processes to manufacture are limited to what we can use in STAMPS, trained on the Duderstadt etc. These include the Wood Shop limited to the big 6 tools unless we receive training on more, fabrication lab which includes laser cutter, 3D printing, cnc router, and vinyl.

## **22. Timescale**

- Prepare the final design for the project in week nine, final product documentation is due in week 15.

## **23. Testing**

- Testing of prototypes will include pulling tests, high-definition prototypes will be tested on Jasper, necessary changes will be made and a second version will be constructed.

## **24. Safety**

- The product must comply with all the necessary and relevant safety guidelines that are required for toys in the market in the United States of America.

## **25. Company Constraints**

- Visually stimulating to a child
- Contains multiple shapes, numbers, and letters
- Meets all health and safety codes
- Easy to clean
- Weighs less than 4 lbs
- Retail costs under \$40
- No Bigger than 12" x 12" 12"

## **26 Market Constraints**

- Inclusive design, numbers will be used.

## **27. Patents**

- Patents are not a concern currently, basic artistic plagiarism should not happen.

## **28. Political/Social Implications**

- Logos and colors used in the product should be checked against individual countries' tastes, designs for 5 other countries available when pertinent, and 5 other languages. the product should be manufactured to high social and ethical guidelines,

## **29. Legal**

- Product adheres to classroom procedures and legislation

## **30. Installation**

- Product is an assembly car game in which the user has the opportunity to put pieces of a car together and mix and match from 5 variations. All parts will be ready to use from opening and the construction of the vehicle is part of the user experience.

## **31. Documentation**

- Product accompanied by appropriate comprehensive documentation for use and maintenance.

## **32. Disposal**

- Products can be fully disassembled and used in wood scrap if wood is used, other materials will be able to be separated through processes outlined for proper recycling.